

Title (en)

4 -substituted azaadamantane derivatives and methods of use thereof

Title (de)

4-substituierte Azaadamantan-Derivate und Verfahren zu ihrer Verwendung

Title (fr)

Dérivés d'azaadamantane à substitution 4 et procédés d'utilisation

Publication

EP 2455383 A2 20120523 (EN)

Application

EP 12150281 A 20080320

Priority

- EP 08732558 A 20080320
- US 89675107 P 20070323

Abstract (en)

The invention relates to compounds that are 4-substituted azaadamantane derivatives, compositions comprising such compounds, and methods of using such compounds and compositions.

IPC 8 full level

A61K 31/439 (2006.01); **A61P 25/00** (2006.01); **C07D 471/18** (2006.01)

CPC (source: EP US)

A61P 3/10 (2017.12 - EP); **A61P 9/10** (2017.12 - EP); **A61P 17/02** (2017.12 - EP); **A61P 21/00** (2017.12 - EP); **A61P 25/00** (2017.12 - EP); **A61P 25/04** (2017.12 - EP); **A61P 25/14** (2017.12 - EP); **A61P 25/16** (2017.12 - EP); **A61P 25/18** (2017.12 - EP); **A61P 25/24** (2017.12 - EP); **A61P 25/28** (2017.12 - EP); **A61P 25/34** (2017.12 - EP); **A61P 29/00** (2017.12 - EP); **A61P 31/04** (2017.12 - EP); **A61P 31/14** (2017.12 - EP); **A61P 39/00** (2017.12 - EP); **A61P 43/00** (2017.12 - EP); **C07D 471/18** (2013.01 - EP US)

Citation (applicant)

- US 4816453 A 19890328 - WATTS ERIC A [GB]
- WO 9400454 A1 19940106 - SEARLE & CO [US], et al
- US 5280028 A 19940118 - FLYNN DANIEL L [US], et al
- US 5399562 A 19950321 - BECKER DANIEL P [US], et al
- WO 9215593 A1 19920917 - SEARLE & CO [US]
- US 5260303 A 19931109 - BECKER DANIEL P [US], et al
- US 5591749 A 19970107 - BECKER DANIEL P [US], et al
- US 5434151 A 19950718 - CAI XIONG [US], et al
- US 5604239 A 19970218 - BECKER DANIEL P [US], et al
- VINCLER, M.; MCINTOSH, J. M.: "Targeting the $\alpha 7$ nicotinic acetylcholine receptor to treat severe pain", EXP. OPIN. THER. TARGETS, vol. 11, no. 7, 2007, pages 891 - 897, XP009159252, DOI: doi:10.1517/14728222.11.7.891
- PATERSON, D.; NORDBERG, A.: "Neuronal nicotinic receptors in the human brain", PROG. NEUROBIOL., vol. 61, 2000, pages 75 - 111
- HOGG, R.C.; RAGGENBASS, M.; BERTRAND, D.: "Nicotinic acetylcholine receptors: from structure to brain function", REV. PHYSIOL., BIOCHEM. PHARMACOL., vol. 147, 2003, pages 1 - 46
- GOTTI, C.; CLEMENTI, F.: "Neuronal nicotinic receptors: from structure to pathology", PROG. NEUROBIOL., vol. 74, 2004, pages 363 - 396, XP004709965, DOI: doi:10.1016/j.pneurobio.2004.09.006
- KELLER, J.J.; KELLER, A.B.; BOWERS, B.J.; WEHNER, J. M.: "Performance of $\alpha 7$ nicotinic receptor null mutants is impaired in appetitive learning measured in a signaled nose poke task", BEHAV. BRAIN RES., vol. 162, 2005, pages 143 - 52, XP004910296, DOI: doi:10.1016/j.bbr.2005.03.004
- GUNDISH, D.: "Nicotinic acetylcholine receptor ligands as potential therapeutics", EXPERT OPIN. THER. PATENTS, vol. 15, no. 9, 2005, pages 1221 - 1239, XP002458675, DOI: doi:10.1517/13543776.15.9.1221
- DE LUCA, V.; LIKHODI, O.; VAN TOL, H. H.; KENNEDY, J. L.; WONG, A. H.: "Regulation of $\alpha 7$ - nicotinic receptor subunit and $\alpha 7$ -like gene expression in the prefrontal cortex of patients with bipolar disorder and schizophrenia", ACTA PSYCHIATR. SCAND., vol. 114, no. 21, 2006, pages 1 - 5
- BROAD, L. M.; SHER, E.; ASTLES, P. C.; ZWART, R.; O'NEILL, M. J.: "Selective $\alpha 7$ nicotinic acetylcholine receptor ligands for the treatment of neuropsychiatric diseases", DRUGS OF THE FUTURE, vol. 32, no. 2, 2007, pages 161 - 170
- COUTURIER, S.; BERTRAND, D.; MATTER, J.M.; HERNANDEZ, M.C.; BERTRAND, S.; MILLAR, N.; VALERA, S.; BARKAS, T.; BALLIVET, M.: "A neuronal nicotinic acetylcholine receptor subunit ($\alpha 7$) is developmentally regulated and forms a homo- oligomeric channel blocked by α -BTX", NEURON, vol. 5, 1990, pages 847 - 56, XP024247708, DOI: doi:10.1016/0896-6273(90)90344-F
- ALKONDON, M.; ALBUQUERQUE, E.X.: "The nicotinic acetylcholine receptor subtypes and their function in the hippocampus and cerebral cortex", PROG. BRAIN RES., vol. 145, 2004, pages 109 - 20
- DAJAS-BAILADOR, F.; WONNACOTT, S.: "Nicotinic acetylcholine receptors and the regulation of neuronal signaling", TRENDS PHARMACOL. SCI., vol. 25, 2004, pages 317 - 24, XP004511269, DOI: doi:10.1016/j.tips.2004.04.006
- BALBANI, A. P. S.; MONTOVANI, J. C.: "Recent developments for smoking cessation and treatment of nicotine dependence", EXP. OPIN. THER. PATENTS, vol. 13, no. 7, 2003, pages 287 - 297
- GURWITZ, D.: "The therapeutic potential of nicotine and nicotinic agonists for weight control", EXP. OPIN. INVEST. DRUGS, vol. 8, no. 6, 1999, pages 747 - 760
- VINCLER, M.: "Neuronal nicotinic receptors as targets for novel analgesics", EXP. OPIN. INVEST. DRUGS, vol. 14, no. 10, 2005, pages 1191 - 1198
- BUNNELLE, W. H.; DECKER, M. W.: "Neuronal nicotinic acetylcholine receptor ligands as potential analgesics", EXP. OPIN. THER. PATENTS, vol. 13, no. 7, 2003, pages 1003 - 1021, XP001183072, DOI: doi:10.1517/13543776.13.7.1003
- DECKER, M. W.; MEYER, M. D.; SULLIVAN, J. P.: "The therapeutic potential of nicotinic acetylcholine receptor agonists for pain control", EXP. OPIN. INVEST. DRUGS, vol. 10, no. 10, 2001, pages 1819 - 1830
- VINCLER, M.; MCINTOSH, J. M.: "Targeting the $\alpha 7$ nicotinic acetylcholine receptor to treat severe pain", EXP. OPIN. THER. TARGETS, vol. 1, no. 7, 2007, pages 891 - 897, XP009159252, DOI: doi:10.1517/14728222.11.7.891
- LEVIN, E.D., J. NEUROBIOL., vol. 53, 2002, pages 633 - 640
- ANDREJUS KOROLKOVAS'S: "Essentials of Medicinal Chemistry", 1988, JOHN WILEY-INTERSCIENCE PUBLICATIONS, pages: 97 - 118
- "Methods in Cell Biology", vol. XIV, 1976, ACADEMIC PRESS, pages: 33
- T. HIGUCHI; V. STELLA: "Prodrugs as Novel Delivery Systems", vol. 14, A.C.S. SYMPOSIUM SERIES
- "Bioreversible Carriers in Drug Design", 1987, AMERICAN PHARMACEUTICAL ASSOCIATION AND PERGAMON PRESS
- IRIEPA, I ET AL., J MOLEC. STRUCT., vol. 509, 1999, pages 105

- FLYNN, D. L. ET AL., BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, vol. 2, 1992, pages 1613
- JONNALA, R. B.; BUCCAFUSCO, J. J., J. NEUROSCI. RES., vol. 66, 2001, pages 565 - 572
- SHIMOHAMA, S. ET AL., BRAIN RES., vol. 779, 1998, pages 359 - 363
- LIU, Q.-S.; KAWAI, H.; BERG, D. K., PROC. NATL. ACAD. SCI. USA, vol. 98, 2001, pages 4734 - 4739
- BITNER ET AL., SOC. NEUROSCIENCE, 2006
- KIHARA, T. ET AL., J. BIOL. CHEM., vol. 276, 2001, pages 13541 - 13546
- FALK, L. ET AL., DEVELOPMENTAL BRAIN RESEARCH, vol. 142, 2003, pages 151 - 160
- TSUNEKI, H. ET AL., J. PHYSIO I. (LONDON), vol. 547, 2003, pages 169 - 179
- ADAMS, C.E. ET AL., DEVELOPMENTAL BRAIN RESEARCH, vol. 139, 2002, pages 175 - 187
- SAWA A., MOL. MED., vol. 9, 2003, pages 3 - 9
- WILENS, T.E.; BIEDERMAN, J.; SPENCER, T.J.; BOSTIC, J.; PRINCE, J.; MONUTEAUX, M.C.; SORIANO, J.; FINCE, C.; ABRAMS, A.; RATER, M., THE AMERICAN JOURNAL OF PSYCHIATRY, vol. 156, no. 12, 1999, pages 1931 - 1937
- WILENS, T.E.; VERLINDEN, M.H.; ADLER, L.A.; WOZNIAK, P.J.; WEST, S.A., BIOLOGICAL PSYCHIATRY, vol. 59, no. 11, 2006, pages 1065 - 1070
- GEERTS, H., CURR. OPIN. INVEST. DRUGS, vol. 7, no. 1, 2006, pages 60 - 69
- LEONARD, S., EUR. J. PHARMACOL., vol. 393, 2000, pages 237 - 242
- ADLER L. E. ET AL., SCHIZOPHRENIA BULL., vol. 24, 1998, pages 189 - 202
- STEVENS, K. E. ET AL., PSYCHOPHARMACOLOGY, vol. 136, 1998, pages 320 - 327
- RADEK ET AL., PSYCHOPHARMACOLOGY (BERL.), vol. 187, 2006, pages 47 - 55
- CORDERO-ERAUSQUIN, M.; CHANGEUX, J.-P., PROC. NATL. ACAD. SCI. USA, vol. 98, 2001, pages 2803 - 2807
- ROWLEY, M. ET AL., J. MED. CHEM., vol. 44, 2001, pages 477 - 501
- FRIEDMAN, J. I. ET AL., BIOL. PSYCHIATRY, vol. 51, 2002, pages 349 - 357
- BECKER, D.P.; FLYNN, D.L., SYNTHESIS, 1992, pages 1080 - 1082
- J. MED. CHEM., vol. 46, 2003, pages 1493 - 1503
- CHEM. COMMUN., 2000, pages 975 - 976
- T. GREENE; P. WUTS: "Protecting Groups in Chemical Synthesis", 1999, JOHN WILEY & SONS
- PABREZA L. A.; DHAWAN, S.; KELLAR K. J.: "3H]-Cytisine Binding to Nicotinic Cholinergic Receptors in Brain", MOL. PHARM., vol. 39, 1991, pages 9 - 12, XP009082215
- ANDERSON, D.J.; BUNNELLE, W.; SURBER, B.; DU, J.; SUROWY, C.; TRIBOLLET, E.; MARGUERAT, A.; BERTRAND, D.; GOPALAKRISHNAN, M., J. PHARMACOL. EXP. THER., vol. 324, 2008, pages 179 - 187

Cited by

EP2497771A1; EP2455383A3

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

Designated extension state (EPC)

AL BA MK RS

DOCDB simple family (publication)

WO 2008118745 A1 20081002; CA 2679876 A1 20081002; CN 101641357 A 20100203; CN 101641357 B 20130918; CN 102690265 A 20120926; EP 2139891 A1 20100106; EP 2139891 A4 20100106; EP 2139891 B1 20120905; EP 2455383 A2 20120523; EP 2455383 A3 20120919; EP 2497771 A1 20120912; ES 2391596 T3 20121128; HK 1135972 A1 20100618; JP 2010522203 A 20100701; JP 5394939 B2 20140122; MX 2009010176 A 20091012; US 2008255180 A1 20081016; US 2012196890 A1 20120802; US 8163915 B2 20120424

DOCDB simple family (application)

US 2008057647 W 20080320; CA 2679876 A 20080320; CN 200880009570 A 20080320; CN 201210167195 A 20080320; EP 08732558 A 20080320; EP 12150281 A 20080320; EP 12155558 A 20080320; ES 08732558 T 20080320; HK 10101953 A 20100224; JP 2009554738 A 20080320; MX 2009010176 A 20080320; US 201213428090 A 20120323; US 5206108 A 20080320